

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An image forming apparatus comprising:
a receiving unit receiving image data;
a detecting unit detecting a screen angle of an image pattern described on a document based on the image data;
a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern; and
a printing unit reproducing a quasi-half-tone using the dither pattern set up by said setup unit, wherein said detecting unit detects screen angles of image data for cyan, magenta and yellow colors, and said setup unit selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color.

2. (Previously Presented) An image forming apparatus according to claim 1, further comprising a reading unit reading a document to obtain the image data.

3. (Canceled)

4. (Currently Amended) ~~An image forming apparatus according to claim 3, in which~~
comprising:
a receiving unit receiving image data;
a detecting unit detecting a screen angle of an image pattern described on a document based on the image data;
a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern; and
a printing unit reproducing a quasi-half-tone using the dither pattern set up by said setup unit,
wherein
said detecting unit detects screen angles of image data for cyan, magenta and yellow colors,
and said setup unit selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color, and

said detection unit further comprises a color conversion unit converting the image data into cyan, magenta, yellow and black image data, a resolution conversion unit converting the cyan, magenta, yellow and black image data into high resolution image data, and a storage unit storing the high resolution image data, wherein screen angles of image data for cyan, magenta and yellow color are detected based on the image data stored in said storage unit.

5. (Currently Amended) ~~An image forming apparatus according to claim 1, in which~~ An image forming apparatus comprising:

a receiving unit receiving image data;

a detecting unit detecting a screen angle of an image pattern described on a document based on the image data;

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern; and

a printing unit reproducing a quasi-half-tone using the dither pattern set up by said setup unit, wherein said detecting unit has a plurality of detection patterns to compare the image data with the detection patterns, counts the numbers of image patterns that match with the detection patterns, and determines an angle of a detection pattern that provides a maximum matching count as the screen angle of the image data.

6. (Currently Amended) ~~An image forming apparatus according to claim 1, in which~~

An image forming apparatus comprising:

a receiving unit receiving image data;

a detecting unit detecting a screen angle of an image pattern described on a document based on the image data;

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern; and

a printing unit reproducing a quasi-half-tone using the dither pattern set up by said setup unit, wherein said detecting unit extracts an attention pixel from the image data, calculates average densities of peripheral pixels located in a plurality of directions relative to a direction perpendicular

to the attention pixel, determines an angle that produces a maximum average density, and elects the determined angle as the screen angle of the image data.

7. (Currently Amended) An image reading apparatus comprising:
a reading unit reading an image data of a document;
a detection unit detecting a screen angle of an image pattern described on a document based on the image data; and
a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern,
wherein said detecting unit detects screen angles of document images for cyan, magenta and yellow colors, and said setup unit selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color.

8. (Previously Presented) An image reading apparatus according to claim 7, further comprises a data generating unit generating a print data in order to reproduce a quasi-half-tone using the dither pattern set up by said setup unit.

9. (Canceled)

10. (Currently Amended) An image reading apparatus according to claim [[9]] 7, in which said detection unit further comprises a color conversion unit converting the image data into cyan, magenta, yellow and black image data, a resolution conversion unit converting the cyan, magenta, yellow and black image data into high resolution image data, and a storage unit storing the high resolution image data, wherein screen angles of document images for cyan, magenta and yellow color are detected based on the image data stored in said storage unit.

11. (Currently Amended) ~~An image reading apparatus according to claim 7, in which~~
An image reading apparatus comprising:
a reading unit reading an image data of a document;

a detection unit detecting a screen angle of an image pattern described on a document based on the image data; and

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern, wherein said detecting unit has a plurality of detection patterns to compare the image data with the detection patterns, counts the numbers of image patterns that match with the detection patterns, and determine an angle of a detection pattern that provides a maximum matching count as the screen angle of the document image.

12. (Currently Amended) ~~An image reading apparatus according to claim 7, in which~~

An image reading apparatus comprising:

a reading unit reading an image data of a document;

a detection unit detecting a screen angle of an image pattern described on a document based on the image data; and

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern, wherein said detecting unit extracts an attention pixel from the image data, calculates average densities of peripheral pixels located in a plurality of directions relative to a direction perpendicular to the attention pixel, determines an angle that produces a maximum average density, and elects the determined angle as the screen angle of the document image.

13. (Currently Amended) A printer controller comprising:

a detection unit detecting a screen angle of an image pattern described on a document based on the image data;

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

a data generating unit generating a print data in order to reproduce a quasi-half-tone using the dither pattern set up by said setup unit, wherein said detecting unit detects screen angles of image data for cyan, magenta and yellow colors, and said setup unit selects from a plurality of dither

patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color.

14. (Canceled)

15. (Currently Amended) ~~A printer controller according to claim 14, in which~~ A printer controller comprising:

a detection unit detecting a screen angle of an image pattern described on a document based on the image data;

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

a data generating unit generating a print data in order to reproduce a quasi-half-tone using the dither pattern set up by said setup unit, wherein

said detecting unit detects screen angles of image data for cyan, magenta and yellow colors, and said setup unit selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color, and

said detection unit further comprises a color conversion unit converting the image data into cyan, magenta, yellow and black image data, a resolution conversion unit converting the cyan, magenta, yellow and black image data into high resolution image data, and a storage unit storing the high resolution image data, wherein screen angles of the image data for cyan, magenta and yellow color are detected based on the image data stored in said storage unit.

16. (Currently amended) ~~A printer controller according to claim 13, in which~~ A printer controller comprising:

a detection unit detecting a screen angle of an image pattern described on a document based on the image data;

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

a data generating unit generating a print data in order to reproduce a quasi-half-tone using the

dither pattern set up by said setup unit, wherein

said detecting unit detects screen angles of image data for cyan, magenta and yellow colors, and said setup unit selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color, and

said detecting unit has a plurality of detection patterns to compare the image data with the detection patterns, counts the numbers of image patterns that match with the detection patterns, and determines an angle of a detection pattern that provides a maximum matching count as the screen angle of the image data.

17. (Currently Amended) ~~A printer controller according to claim 13, in which~~ A printer controller comprising:

a detection unit detecting a screen angle of an image pattern described on a document based on the image data;

a setup unit selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

a data generating unit generating a print data in order to reproduce a quasi-half-tone using the dither pattern set up by said setup unit, wherein

said detecting unit detects screen angles of image data for cyan, magenta and yellow colors, and said setup unit selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color, and

said detecting unit extracts an attention pixel from the image data, calculates average densities of peripheral pixels located in a plurality of directions relative to a direction perpendicular to the attention pixel, determines an angle that produces a maximum average density, and elects the determined angle as the screen angle of the image data.

18. (Currently Amended) An image forming system comprising:

a receiving apparatus for receiving image data;

a printer controller for detecting a screen angle of an image pattern described on a document based on the image data, selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

a printer for reproducing a quasi-half-tone using the dither pattern set up by said printer controller, wherein

said printer controller detects screen angles of image data for cyan, magenta and yellow colors, and selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color.

19. (Previously Presented) An image forming system according to claim 18, further comprising a reading apparatus for reading a document to obtain the image data.

20. (Canceled)

21. (Currently Amended) An image forming system according to claim ~~[[20]]~~ 18, in which said printer controller further comprises a color conversion unit converting the image data into cyan, magenta, yellow and black image data, a resolution conversion unit converting the cyan, magenta, yellow and black image data into high resolution image data, and a storage unit storing the high resolution image data, wherein screen angles of the image data for cyan, magenta and yellow color are detected based on the image data stored in said storage unit.

22. (Currently Amended) ~~An image forming system according to claim 18, in which~~ An image forming system comprising:

a receiving apparatus for receiving image data;

a printer controller for detecting a screen angle of an image pattern described on a document based on the image data, selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

a printer for reproducing a quasi-half-tone using the dither pattern set up by said printer controller, wherein

said printer controller has a plurality of detection patterns to compare the image data with the detection patterns, counts the numbers of image patterns that match with the detection patterns, and determines an angle of a detection pattern that provides a maximum matching count as the screen angle of the image data.

23. (Currently Amended) ~~An image forming system according to claim 18, in which~~

An image forming system comprising:

a receiving apparatus for receiving image data;

a printer controller for detecting a screen angle of an image pattern described on a document based on the image data, selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

a printer for reproducing a quasi-half-tone using the dither pattern set up by said printer controller, wherein

said printer controller extracts an attention pixel from the image data, calculates average densities of peripheral pixels located in a plurality of directions relative to a direction perpendicular to the attention pixel, determines an angle that produces a maximum average density, and elects the determined angle as the screen angle of the image data.

24. (Currently Amended) A computer-readable medium for storing a program readable and executable by a computer, said program performing the steps of:

(A) receiving image data;

(B) detecting a screen angle of an image pattern described on a document based on the image data;

(C) selecting from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and setting the dither pattern; and

(D) reproducing a quasi-half-tone using the setup dither pattern, wherein

said step (B) of said program performs the steps of (1) converting the image data into cyan, magenta, yellow and black image data, (2) converting said cyan, magenta, yellow and black image data into high resolution image data, (3) storing the high resolution image data, and (4) detecting

screen angles of image data for cyan, magenta, and yellow colors based on the stored image data.

25. (Previously Presented) A computer-readable medium according to claim 24, in which said program further performs the steps of (E) reading a document to obtain the image data, and (F) transmitting the read image data.

26. (Canceled)

27. (Previously Presented) A computer-readable medium according to claim 24, in which said step (B) of said program performs the steps of (1) comparing the image data with a plurality of detection patterns, (2) counting the number of image patterns that match with the detection patterns, (3) selecting a detection pattern that provides a maximum matching counts, and (4) determining an angle of the selected detection pattern as the screen angle of the image data.

28. (Previously Presented) A computer-readable medium according to claim 24, in which said step (B) of said program performs the steps of (1) extracting an attention pixel from the image data, (2) calculating average densities of peripheral pixels located in a plurality of directions relative to a direction perpendicular to the attention pixel, (3) determining an angle that produces a maximum average density, and (4) electing the determined angle as screen angle of the image data.

29. (Currently Amended) An image processing apparatus comprising:
a receiving unit receiving image data;
a detecting unit detecting a screen angle of an image pattern described on a document based on the image data; and
a setup unit selecting, from a plurality of dither patterns, a dither pattern with a screen angle different from the detected screen angle and setting up the dither pattern, wherein said detecting unit detects screen angles of image data for cyan, magenta and yellow colors, and said setup unit selects from a plurality of dither patterns a dither pattern with a screen angle different from the detected screen angle and sets up the dither pattern for each color.